

BALÆNOPTERA BRYDEI.

61. On the External Characters and Biology of Bryde's Whale (*Balenoptera brydei* *), a new Rorqual from the Coast of South Africa. By ØRJAN OLSEN, Zoological Laboratory, Christiania University †.

[Received June 27, 1913: Read November 25, 1913.]

(Plates CIX.-CXIII.‡)

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Introductory remarks.

Before the Norwegian whaling trade started in South Africa in 1909, opportunities for studying whales from that part of the world seldom occurred, but when at rare intervals one of the bigger whales was stranded on the S. African coast, if it was not at once eaten by sharks it was, as a rule, quickly destroyed by the warm climate and heavy sea breaking on the beach.

The country is very extensive, the communication along the sea-shore bad, and journeys difficult and expensive. If, therefore, one of the few scientists of the country received a report of a stranded whale, it was as a rule impossible for him to reach the spot before it was too late. So when we take all these difficulties into consideration it is not surprising that the bigger whales from this part of the world have remained unknown until quite recently.

Mr. W. L. Selater has only the following to say about the genus *Balenoptera* in the standard work 'Fauna of South Africa' (1901):—"Fin-whales are not uncommon off the coast of S. Africa, but so far as I know, no specimen has ever been secured for a museum, or been examined by a competent authority." After this he gives the characteristics of the four northern fin-whales, in order to facilitate comparison with the Cape species of the same genus.

The South African whaling industry was founded by Consul Johan Bryde, from Sandefjord, Norway, who in 1909 erected the first factory in Durban and another in the following year in Saldanha Bay on the west coast.

When the Norwegian whalers returned home after having finished their first season in Saldanha Bay, they mentioned a whale which had been found outside the latter place, and which was very similar to the "seihval" (*Balenoptera borealis*).

As the "seihval" (Rudolphi's whale) had been only known

* [I have consulted the issue of the Norwegian newspaper 'Tidens Tegn' dated November 12th, 1912, in which this name was first published by the author. Technically the species dates from the description in that Journal, but no details are given there which are not fully explained here.—EDITOR.]

† Communicated by the SECRETARY.

‡ For explanation of the Plates see pp. 1089, 1090.

until then as inhabiting the eastern parts of the North Atlantic, it was very desirable from a scientific point of view to get further information about the species from Saldanha Bay, and also about other South African whales, by studying them on the spot. Mr. Johan Bryde, who has often displayed his interest in and generosity towards science, then offered me the necessary pecuniary assistance, and thus enabled me to undertake a journey to South Africa to study the above questions and some other scientific matters there. During this expedition, which lasted nearly a year, I visited both the east and west coasts and was able to make many interesting observations.

The "seihval" from Saldanha Bay proved to be very different from Rudolphi's whale (*B. borealis*), and is described in this paper as a new species, named after Johan Bryde, to whose generosity I am so much indebted. I have also to thank Capt. Andr. Ingebrigtsen, Capt. P. J. T. Larsen, and Mr. Lars Iversen for their kind help.

BALÆNOPTERA BRYDEI Olsen.

'Tidens Tegn,' November 12, 1912. (A Norwegian newspaper.)

Synopsis.

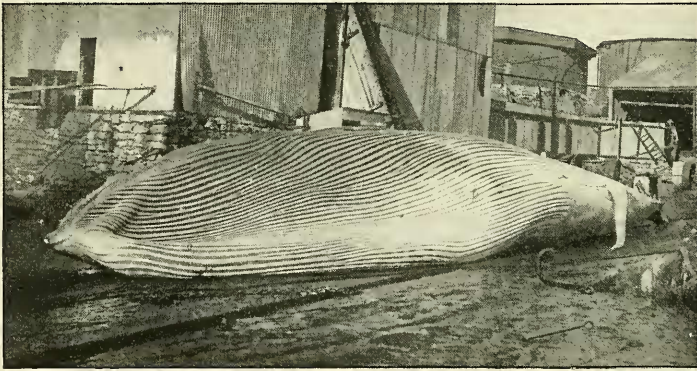
The average total length is 13 and the maximum nearly 15 metres. The shape is very elongated; the greatest height 13-14 per cent. of the total length. The distance from the tip of the snout to the angle of the mouth is about 20 per cent. of the total length. The flippers are slender and pointed, 8-10.6 per cent. of the total length. The dorsal fin is small; its vertical height 2-2.4 per cent. of the total length. The distance from the tip of the snout to the anterior margin of the dorsal fin is 69-70 per cent. of the total length, occasionally shorter; the minimum is 65 per cent. The distance from notch of flukes to vent is about 27.2 per cent. of the total length; the number of ventral furrows 42-54; they extend backwards to the umbilicus, about 1.2 metres behind the tip of the flippers. The number of baleen-plates (without the anterior rudimentary baleen) 250-280; their greatest length nearly 0.50 metre. The bristles of the baleen are very thick, long and stiff, not curling; their colour is grey. The anterior baleen is as a rule more or less white; the other greyish-black. The upper side of the flipper is bluish-black, the under side grey. The colour of the body is bluish-black above, with oblong light-coloured spots; the throat and an area up to about 0.65 metre below the flippers on each side are dark bluish-grey; the other parts of the under side are white, more or less yellowish, often with a grey band across the belly in front of the umbilicus.

General Characteristics and Measurements.

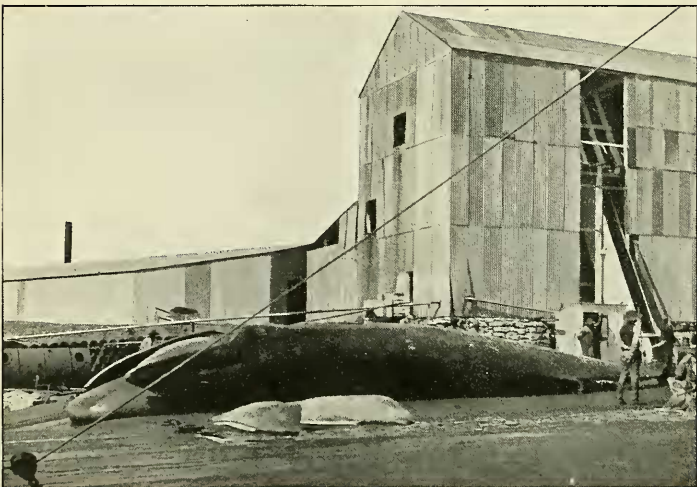
Balenoptera brydei is a comparatively small species, with an average total length of about 13 metres, or occasionally a little



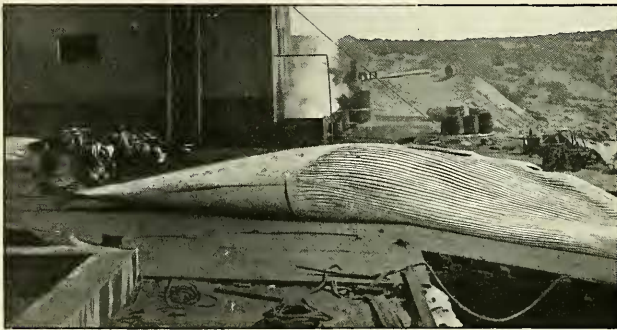
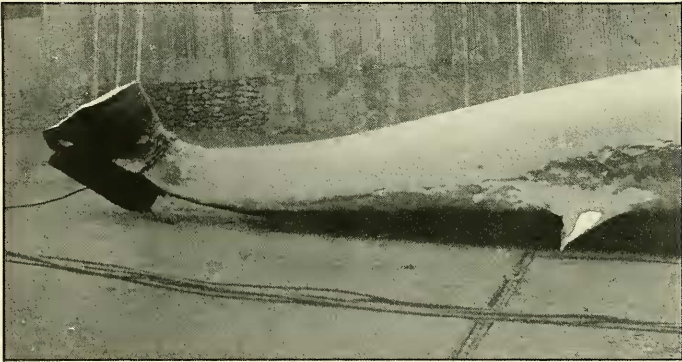
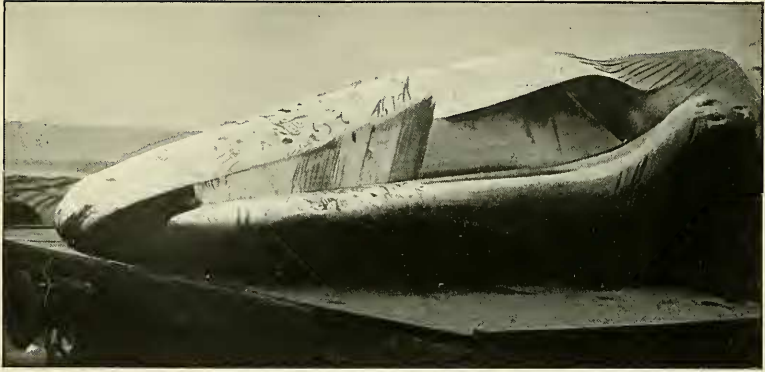
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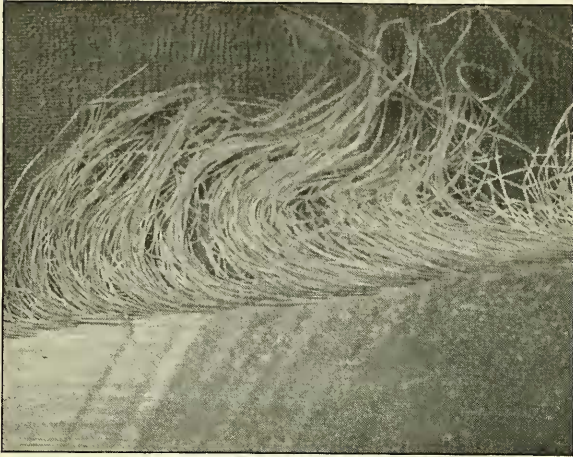


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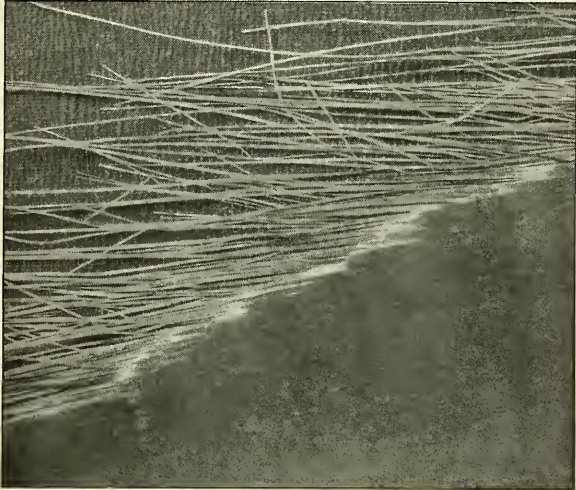


BALÆNOPTERA BRYDEI.

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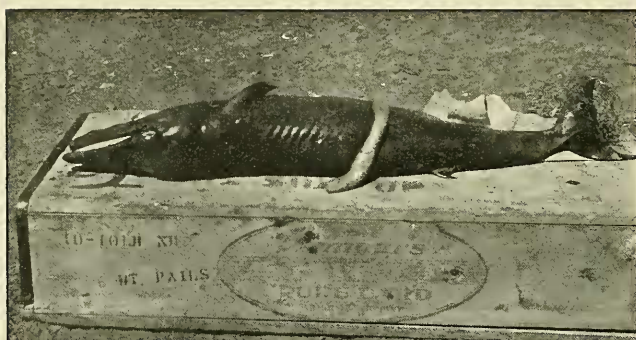
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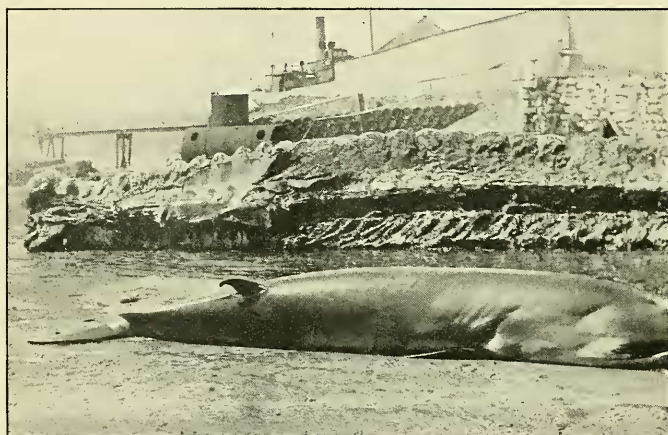


9, 11A. BALÆNOPTERA BOREALIS. 10, 11B. B. BRYDEI.

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BALÆNOPTERA BRYDEI.

more. The longest specimen measured by me, and one of the largest captured by the Norwegian whalers in South Africa, was a female from Durban measuring 14.95 metres. The female seems to attain a slightly larger size than the male.

During my stay at the whaling stations in Durban and at Saldanha Bay I was able to examine twelve specimens in all; and the following table gives the measurements and some other characteristics of three which showed comparatively great differences.

Measurements of *Balenoptera brydei* (in metres).

	♂. 12.9.12.		♂. 5.3.13.		♀. 15.11.12.	
		per cent.		per cent.		per cent.
Total length	12.35	100	13.07	100	14.95	100
Tip of snout to anterior end of eye	2.41	19.5	2.40	18.3	2.9	19.4
" " angle of mouth	2.50	20.2	2.48	18.9	2.9	19.4
" " anterior end of dorsal fin ..	8.55	69.2	8.5	65.0	10.5	70.0
" " blowholes	1.85	15.0	2.05	15.6	2.36	15.6
" " flippers (anterior margin) ..	4.0	32.3	4.0	30.6	4.9	32.7
From notch of flukes to vent.....	3.38	27.3	3.56	27.2	4.5	30.1
" " " hinder side of penis or vulva	4.43	35.0	4.61	35.2	4.8	32.1
Length of the flippers (from axilla)	1.0	8.0	1.39	10.6	1.23	8.3
Greatest breadth of the flippers	0.33	2.6	0.36	2.7	0.40	2.6
Breadth of the flippers at base .....	...	...	0.28	2.1	0.35	2.3
Vertical height of the dorsal fin	0.30	2.4	0.30	2.2	0.31	2.0
Diameter of eye	0.10	...	0.12	...	0.10	...
Length of the eye-opening	0.75	...	...	...	...	...
Length of the blowholes .....	...	...	0.40	...	0.32	...
Distance between the anterior ends of the blowholes .....	...	...	0.02	...	0.04	...
Distance between the posterior ends of the blowholes .....	...	...	0.22	...	0.18	...
Length of the anus	0.10	...	0.12	...	0.08	...
Length of the penis or vulva.....	1.37	...	1.06	...	0.18	...
Diameter of penis at base	0.20	...	...	...	...	...
Number of baleen-plates in each jaw (the rudimentary baleen not included)	ca. 260	...	ca. 250	...	ca. 280	...
Greatest length of the baleen-plates (with- out bristles)	0.38	...	0.32	...	0.49	...
Greatest breadth of the longest baleen (at the base)	0.18	...	0.14	...	0.23	...
Greatest thickness of the longest baleen ..	0.05	...	...	...	ca. 0.03	...
Length of the anterior (rudimentary) baleen	0.15	...	0.12	...	...	...
Length of the longest bristles (on the longest baleen)	0.20	...	0.14	...	0.12	...
Number of furrows between the flippers...	48	...	54	...	54	...
Height of the body at the flippers.....	ca. 1.8	14.7	...	...	...	...
Distance between the flippers on the ventral side .....	...	...	2.0	...	...	...

The shape of *B. brydei*, as of the other species of the genus *Balenoptera*, varies somewhat, but as a rule it is remarkably elongated (Pl. CIX.), often even more so than in the Fin-whale

(*B. physalus*). The greatest height of the body (at the anterior end of the flippers) is usually about 14 per cent. of the total length, occasionally less, and only in a single case (a male of Saldanha Bay, 12.9.12) is it as much as 14.7 per cent. The greatest breadth is almost the same as the height, or a little less. In five specimens measured by me in Saldanha Bay the proportion of the greatest breadth (at the flippers) compared with the total length was as follows:—12.8, 12.9, 14, 14.2 per cent., which gives an average breadth of 13.4 per cent. In a single case—that of a very thin male—the breadth was only 11.8 per cent. The body is therefore of a far less powerful build than in *B. borealis* and *B. acutorostrata*, and resembles more that of the Fin-whale (*B. physalus*). The hinder part of the body (from the genital opening to the tail) is comparatively less compressed than in *B. borealis*, but decreases gradually and slowly towards the rear up to the root of the tail-flukes. The caudal part forms a thin ridge above and below, which is at its sharpest along the dorsal line (Pl. CXI. fig. 7). In order to facilitate the comparison between *B. brydei* and the other species of the genus *Balenoptera*, I have added a table showing the most remarkable differences. I have not considered it necessary to mention the Blue whale (*B. musculus*), as its size, dorsal fin, colour, and many other characteristics make any confusion with *B. brydei* impossible.

TABLE

showing the most notable differences between *Balenoptera brydei* and the other species of the same genus (except the Blue whale).

	<i>B. acuto- rostrata.</i>	<i>B. borealis.</i>	<i>B. brydei.</i>	<i>B. physalus.</i>
Total length (maximum)	10.3 m.	16.3 m.	15 m.	24 m.
Per cent. of total length.				
From tip of snout to blowhole	13.5	15.1	15.3	...
" " " angle of mouth	13-17	17.8	19.4-20.2	ca. 20
" " " flippers .....	...	29.8	30.6-32.7	33
" " " dorsal fin .....	...	61-68	65-70	69-73
Height of body at the flippers	20	18	14	...
Height of the dorsal fin	4-5.6	3.3-4.7	2-2.4	...
Length of the flippers (from axilla) .....	...	8.7-9.3	8-10.6	9.9-11.3

Greatest breadth of the flippers com- } pared to their length .....	...	{ as 1 to 3.5 or 3.6	as 1 to 2.2	...
Number of ventral furrows .....	...	...	42-54	60-100
Number of baleen-plates (without } the rudimentary baleen) .....	...	320-340	250-280	350-400
Greatest length of baleen in adult } specimens (without bristles)	0.20 m.	0.72 m.	0.49 m.	0.90 m.

	<i>B. borealis.</i>	<i>B. brydei.</i>
Distance from notch of flukes to anus.	31·6 per cent. (of the total length).	27·2 per cent. (of the total length).
Ventral furrows.....	Extend to the middle of the belly one foot behind tip of flippers.	Extend to the umbilicus, 3·5 feet behind tip of flippers.
Colour.....	The throat always white: the underside behind anus bluish black, like the back.	The throat dark bluish-grey: the underside behind anus <i>white</i> , sometimes yellowish or whitish grey.
Bristles of baleen.....	Unusually fine, short, curling and wool-like, white.	Very thick, long and stiff, not curling, colour grey.
Food and habits.....	Always small crustaceans, chiefly Calanidæ. Never takes fish.	Fish. When it occasionally takes crustaceans, they are Euphausiidæ, like the Blue whale.
	Blows as a rule only once or twice during each visit to the surface.	Blows 5-6 times during each visit to the surface (like the Fin- and Blue whales).
	Migratory.	Stationary.

The distance from the tip of the snout to the angle of the mouth is, as we have seen, 19·4-20·2 per cent. of the total length, about the same as on the fin-whale, whereas in Rudolphi's whale it is only about 17·8 per cent. (according to R. Collett). The tips of the snout and of the lower jaw are also far more acute than in *B. borealis*, more resembling those of *B. physalus*.

The *flippers* are very slender and pointed, generally comparatively short, but varying in length from 8-10·6 per cent. of the total length, and they are thus sometimes remarkably longer than has ever been observed in *B. borealis*. Their greatest breadth (at the middle) compared to the length is as 1 to 2·2. They differ in this respect very much from those of *B. borealis*, where the proportions are as 1 to 3·5 or 3·6, and they are more like the flippers of *B. physalus*. There is often a cut of about an inch in breadth and depth in their posterior margin, near the axilla.

The *dorsal fin* is of very moderate size, and its vertical height only about 2·2-2·4 per cent. of the total length. It is thus smaller than is usual in the fin-whale, and very different from the large dorsal of *B. borealis* and *B. acutorostrata*. Its length from the anterior to the posterior end is only slightly greater than its vertical height. The front margin is convex, with a slightly curved apex, and the hinder margin is deeply concave and often has a small cut in it near the base. The point of the fin is very thin and sharp. The dorsal fin is placed noticeably further back than is the case in Rudolphi's whale—often where it would be on the fin-whale. In twelve adult specimens examined by me the distance from the tip of the snout to the anterior end of the dorsal fin was in most cases 69-70 per cent. of the total length, and in one instance only 65 per cent. In *B. borealis* the dorsal

is usually placed anterior to the beginning of the last third of the body (according to R. Collett).

The *tail-flukes* are broad and comparatively somewhat shorter than in *B. borealis*. The length of each fluke is from 10–11 per cent. of the total length, or about the same as in the fin-whale. In a male specimen, of which the total length was 13·07 metres, their thickness at the base was about 0·20 metre and 0·12–0·14 metre halfway between the base and the tip.

On each side of the tail, above and below, there is a thin ridge which gradually becomes lower towards the rear, and disappears between the flukes, about 0·10 metre from the end of the body.

The *eyes* are comparatively larger than in the fin-whale, and placed just above the angle of the mouth, in the same place as in the fin-whale, but further back than in *B. borealis*.

The distance from the tip of the snout to the *blowholes* is about 15·3 per cent. of the total length. In adult specimens the length of the blowholes is from 0·32–0·40 metre. They are placed on a broad ridge on the head in two long furrows, which converge very much towards the front. Between them there is a shorter central furrow.

The *ventral furrows* run along the whole length of the lower jaw and extend to the umbilicus, about 1·2 metres behind the tip of the flippers (as in the fin- and blue whales). In *B. borealis* they end about 0·30 metre beyond the tip of the flippers (R. Collett). Above the long furrows there are 5–8 shorter ones with a length of 0·30–0·60 metre, and these terminate in the axilla. In front of the flippers there are also a few short furrows which extend forward into the angle of the mouth. On the belly, in the area below the angle of the mouth, some shorter furrows are as a rule wedged in amongst the others. Just in front of the umbilicus, where the long furrows terminate, a number of quite short furrows are also to be seen. The number of long furrows varies from 42–54.

The *anus* is noticeably further to the rear than in *B. borealis*, and the distance from the anus to the notch of the flukes is as a rule about 27·2 per cent. of the total length.

The *penis* is rather big and with the *vulva* is placed in a generally dark-coloured furrow 1–1·5 metres long, about two-thirds of which run anterior to the genital opening, and about one-third behind.

A varying number of whitish-grey oblong spots, about 7–8 cms. in length and about 3 cms. in breadth, are distributed over the whole body. Along the centre of their long axis there runs usually a dark line, from which fine radii of similar lines run in all directions. These patches probably show places once attacked by parasites. In addition to these whitish spots a number of fresh wounds, with a length of as much as 10 cms. and 3–4 cms. deep, can be seen in most cases. They are marks caused by parasites—generally a *Pennella*.

The majority of specimens of Bryde's whale are very thin, and their stratum of fat has an average thickness of only 4-5 cms. In a single instance—that of an old and probably diseased female specimen from Durban—the thickness was only about 3·5 cms. Some big specimens, especially females with fetus, may be quite fat and their stratum of fat may attain a thickness of as much as 7 cms., at any rate on the dorsal side. Specimens as fat as this may yield 15 or occasionally nearly 20 barrels of oil, while the common yield of this species is only 6-8 barrels.

Baleen.

During my stay in S. Africa I was able to examine the baleen of twelve adult specimens, and also a large quantity of whale-bone which lay heaped up outside Mr. Bryde's whaling station in Saldanha Bay.

The *baleen* of *B. brydei* is very distinctive of this species, and compared with the size of the whale, very small (see Pl. CXII. fig. 11 B). The longest baleen-plates measured by me, and from a female specimen of nearly 15 metres in length, were only 0·49 metre long (the bristles not included), while baleen from a Rudolphi's whale of the same size attains a length of about 0·70 metre. The baleen differs remarkably in shape from that of *B. borealis*; whereas the baleen-plates of *B. borealis* are very long and slender, those of *B. brydei* are comparatively very broad and curve inwards along the inner margin. The comparative proportions of the breadth of the largest baleen-plates at their base and their length were in four specimens of *B. brydei*:—43, 43·1, 46·9, and 47 per cent., which gives an average of 45 per cent. In *B. borealis* the same proportion is about 27·2 per cent. (see Pl. CXII. fig. 11 A). The baleen of *B. brydei* seems also to be comparatively somewhat thicker and more strongly built than in *B. borealis*. The number of plates in twelve specimens examined by me was, as a rule, about 260 in each jaw, though the number varied between 250 and 280. But if the rudimentary plates are included, the number may be about 350. The number of baleen-plates in *B. brydei* is remarkably small; for Rudolphi's whale the number (without the rudimentary baleen) is from 320 to 340, and in the fin-whale from 360 to 400.

The rudimentary plates along the tip of the upper jaw are not compressed, and attain a length of 0·10-0·15 metre; they are numerous and difficult to count. The first compressed plate is seen about 0·25-0·30 metre behind the tip of the snout. There is also some rudimentary baleen above the angle of the mouth.

The *bristles* (Pl. CXII. fig. 10) are longer than in *B. borealis* and thick and stiff, not curling, and on the whole of very strong construction—even comparatively stronger than in the fin-whale. Their average thickness is about 1 mm.; a little more at the distal end of the baleen, and perhaps a little less at the base.

The distance between these rows in adult specimens was about 18 mm., or a little more than between the successive hairs in each row. Outside the upper end of these rows were two other hairs on each side, placed at the same distance from the long rows as between the rows themselves. I noticed no hairs on the upper jaw.

The number of hairs is thus 28 in all. On two fetuses, with a length of 3.78 and 0.935 metres, the hairy covering was as well developed as in adult specimens. The length of the hairs was from 5-10 mm.

Colour.

The upper side of the body—above the flippers—is bluish black, and in colour much resembles the fin-whale. After death the colour on this part becomes almost entirely black. On the sides of the body the colour becomes gradually lighter, and there is no sharply defined border between the dark colour of the upper side and the white belly. The flippers are of the same colour as the back above, or sometimes darker; below they are grey, occasionally whitish grey. The under side of the head, and a band extending to about 0.70 metre below the flippers and backwards to their tip are bluish grey. The centre of the belly is a more or less yellowish white. In the dark area below the flippers some isolated white spots may sometimes be seen; similar white patches are occasionally distributed along the centre of the under side of the lower jaw, and more rarely a small white line runs out from the white area on the belly to within one metre or less behind the tip of the lower jaw. On the border between the dark colour of the throat and the white belly there are often a number of bluish grey patches or stripes, and these are more thickly sprinkled towards the front, and then gradually form a more uniform dark colour in front of the angle of the mouth. Between the tip of the flippers and the umbilicus—at the posterior end of the long furrows—the white colour of the under side is generally interrupted by a bluish grey belt running across the stomach. This belt, which has a breadth varying between 0.70 and 1.5 metres, is often formed by a large number of smaller and larger patches or stripes, not of uniform colour; in other cases it is very little developed.

Considerable variations occur in the breadth, size, and shape of the white area on the belly.

From the genital opening to the tip of the tail-flukes the whole under side is dirty white, sometimes yellowish or whitish grey. This white area begins above the genital opening at the middle line of the sides of the body, and in some specimens is further back and becomes gradually narrower.

From the tip of the upper jaw, near the roots of the baleen, sometimes a white stripe runs backwards, and the length of this is about 0.5 metre and the breadth 5-7 cms.

The dark patches which are sometimes found on the under side are generally situated in the long furrows, or in the furrow at the genital opening.

Occurrence and Capture.

Balenoptera brydei seems to be common everywhere along the south coast of Africa. It is especially so in Saldanha Bay, though also in Mossel Bay and near the Cape of Good Hope this species is captured in rather large numbers, and is often observed from whaling steamers going along the S. African coast.

In Durban *B. brydei* is comparatively rare, but is occasionally to be seen at all seasons of the year. The total number captured from three whaling stations on the Natal Bluff during the season 1912 was only sixteen, of which one (captured early in November) was only about 8 metres long, and not fully developed. In 1911 six specimens were captured from Mr. Bryde's station in Durban. Of these two were taken on June 5th, one on the 14th, and one on the 15th of the same month, one on October 10th, and one on November 7th. In 1912 the following were caught from the same station:—one on June 4th, one on July 18th, one on Aug. 19th, and one on Nov. 15th. Some specimens were seen but not pursued because, as the whalers told me, they were very shy and difficult to catch, and at the same time their value was comparatively small. At Mr. Bryde's whaling station near Inhambane, Portuguese E. Africa ($23^{\circ} 30' S. l.$), *B. brydei* was very seldom seen, and only a single specimen of it was captured. Further to the north at Bazaruto Is. ($21^{\circ} 45' S. l.$), where the floating factory "Mangoro" was stationed for two months, *B. brydei* was never seen. Bryde's whale therefore seems to be a southern species, avoiding the warm waters of the tropics, and it is therefore rare on the east coast where the hot Mozambique current runs southward.

Almost all the specimens of *B. brydei* captured in Saldanha Bay ($33^{\circ} S. l.$), were found between this bay and Capetown, and the whalers told me that this species was much more rarely seen north of Saldanha. This fact is quite in accordance with the experiences of Mr. Green, the manager of Storm Bull's whaling station in Walfisch Bay. He considered the "seihval" to be very rare along the coast of German S.W. Africa, and he had not observed this species at all in Walfisch Bay.

I was somewhat surprised therefore when Capt. Andr. Ingebrigtsen, who had been stationed with a floating factory at Porto Alexandre, Benguela ($15^{\circ} 45' S. l.$) for a couple of years, told me that he had observed rather a large number of "seihval" there. The same statement was made by Capt. L. Fredriksen, who had seen many specimens of this whale outside Lobito Bay, and single ones as far north as $7^{\circ} S. l.$ But when we remember that a cold antarctic current runs along the west coast of Africa

far to the north, it is not so surprising that *B. brydei* may be able to live outside the tropical parts of the coast. The conditions of existence, however, for this species cannot be very good there, because the 3 or 4 specimens captured (during nearly three years) outside Pt. Alexandre were all unusually thin and did not yield more than 2-3 barrels of oil, or sometimes even less. All the specimens seen at this place were in very bad condition, with numerous wounds from parasites over the whole body, and so thin that the whalers did not care to pursue them. They were never seen accompanied by young ones outside Pt. Alexandre, and they were all lying almost motionless and did not make any efforts to escape from the steamer. Unfortunately not a single specimen has been examined from this part of the African coast, and very few were captured, because the whalers always preferred to take the more valuable "humpback" whales, which were to be found in the same locality. It has therefore not yet been proved whether the "seihval" from the coast of tropical W. Africa really is *Balænoptera brydei*.

Capt. Andr. Ingebrigtsen also told me that the "seihval" outside Pt. Alexandre appeared in these waters every year about the middle of June and disappeared again about September or October.

If this whale follows the same route as the "humpback" generally does—along the coast—we might expect to see migrating specimens pass Saldanha Bay, and to find a greater number of them there in the spring, October–November, but this is not the case. It is probable therefore that they choose another route, perhaps further out to sea, where the current is stronger and the water cooler.

It is not impossible that some of the "sei"-whales from Portuguese W. Africa may have been Rudolphi's whale (*B. borealis*), a typical specimen of which was captured outside Saldanha Bay in November 1912. This is the first S. African specimen of *B. borealis* which has been reported further south than off Cape Blanco (20° 45' N. l.). It was easily recognized as the proper "seihval" by the Norwegian whalers; and Capt. P. J. Larsen kindly presented me with a quantity of the baleen, which was quite distinctive of *B. borealis* (Pl. XCII. fig. 9).

As I have mentioned above, Saldanha Bay is the locality where the greatest number of *B. brydei* are captured. The whaling trade was started there in 1910, and only twenty-four specimens of the "seihval" were captured in the first year, and all of them in the spring. The first three specimens were caught on March 9th and 29th, and on April 1st. Five were captured from the 20th to the 30th of April, four from the 1st to the 10th of May, six from the 10th to the 20th of May, and six from the 20th to the 30th of May. After that time the "humpback" was found at this spot in large numbers.

The following list shows the number of "seihval" captured at

Mr. Bryde's station in Saldanha Bay during the season of 1911 (with two whaling steamers), and in the season of 1912 (with three whaling steamers).

	1911.	1912.
March 20-30	—	7
April 1-10	—	8
April 10-20	—	37
April 20-30.....	—	22
May 1-10	—	25
May 10-20	6	5
May 20-30	8	2
June 1-10	2	1
June 10-20	5	9
June 20-30	3	3
July 1-10	1	2
July 10-20	2	—
July 20-30	2	9
Aug. 1-10	2	9
Aug. 10-20	2	7
Aug. 20-30	2	3
Sept. 1-10	—	1
Sept. 10-20.....	—	1
Sept. 20-30.....	—	1
Oct. 1-10	1	—
Oct. 10-20	—	1
Oct. 20-30	—	2
Nov. 1-10	—	1
Nov. 10-20	1	6
Nov. 20-30.....	3	3
Dec. 1-10	2	3
Dec. 10-20	—	1
	—	—
Total.....	42	169

The table shows that the majority of *B. brydei* are captured in the autumn (April and May), and at this time this species also seems to be the most numerous outside Saldanha Bay, as well as Durban. But we see also that it is captured in greater or less numbers during the whole season, and it is seen outside Saldanha Bay all the year round.

The difference between the real number of *B. brydei* in the autumn and at other times of the year is in fact not so great as the capture seems to indicate, because the whalers always prefer to take the more valuable "humpback" whale when this species appears on the spot in May. In 1912 an unusually small number of "humpbacks" was seen, and the trade depended on the "seihval" to a greater extent than before.

In 1913 the first specimen was caught on March 5, and from

that date until I left Saldanha Bay a fortnight later, the total catch of *B. brydei* consisted of eleven specimens. Almost all of these specimens were found unusually far (40–70 miles) from the sea-shore, surrounded by large numbers of crustaceans, Euphausiidae. As a rule the whales are to be found quite close to the coast, and it is probably the richness of crustaceans further out to sea that has tempted them to go out there. It is worth mentioning that these crustaceans were Euphausiidae, which the Blue whale prefers, and not Calanidae, the chief food of Rudolphi's whale.

Food.

The food of *B. brydei* consists chiefly of fish, apparently usually a variety of herring which is often found in large quantities (many hectolitres) in its stomach. This, for instance, was the case with a male examined by me in Saldanha Bay on September 12th, 1912. It sometimes takes a species of mackerel one foot or more in length, and in Durban more than a hectolitre of this fish has been found in its stomach.

B. brydei is very voracious on the whole—more so than any other species of its genus. As an illustration of this, Capt. L. Fredriksen told me that he had many times seen it hunting among large crowds of small sharks, and that he had found sharks of a length of more than two feet in its stomach. A case from Saldanha Bay which was related by Captain Christoffersen, and mentioned by many others, was most astonishing: they had found there no less than 15 large penguins (*Spheniscus demersus*) and “malagass” (*Sula capensis*) in its stomach. These birds, the moment the whale reached the surface of the water, had probably dived down into its open mouth endeavouring to catch fish in that abundant hunting-ground, and had thus themselves been involuntarily captured by the whale. In similar cases observed among *B. borealis*, the birds have always been spat out of the mouth again, and it seems hardly possible that such large birds as those mentioned could be swallowed by this species at all.

B. brydei is not dependent for food on the occurrence of crustaceans in the sea and so does not migrate, but is generally seen very close to the coast pursuing fish.

Like the fin-whale, *B. brydei* occasionally takes crustaceans and then of a larger kind, the Euphausiidae.

Biology, etc.

In its biology *B. brydei* is most like *B. acutorostrata* and *B. physalus*, and when the Norwegian whalers started their trade in South Africa they were doubtful as to whether they should consider this species to be a fin-whale or a “sei”-whale (*B. borealis*). In Durban many of them preferred to call it a

“sildehval” (herring whale), because it hunted herrings. But as the colour and size were most like that of the “seihval,” they generally called it so, although they knew that it was not the proper “seihval.”

In Saldanha Bay, where the largest numbers were captured, it was often called “bastard” or “seihval bastard,” and considered to be a hybrid between the fin-whale and the “seihval,” because it had the baleen of the first species, but some other characteristics of the latter. Besides this “bastard,” the whalers in Saldanha Bay told me about another variety of “seihval” with exceedingly dark-coloured baleen. It was of somewhat smaller size than the “bastard,” quicker in its movements, dived deeper down in the sea, and was more difficult to catch. It was seen in approximately the same numbers all the year round, and in the same localities as the “bastard,” but seemed to occur in greater numbers northward of Saldanha Bay than the latter, as proved by Capt. Christoffersen, who had captured it many times outside Paternoster Bay. When the whaling steamers went to Capetown for coaling, these two varieties were often seen in greater numbers together, and the whalers picked out the “bastard” as more valuable and easier to catch.

Unfortunately, during my stay at Saldanha Bay, not a single specimen of this smaller variety was captured, and it is therefore difficult to say anything about them, but I consider it probable that they are only younger specimens of *B. brydei*.

B. brydei is as a rule to be found very close to the coast, generally in large numbers, and it is comparatively rarely found further out to sea. The whalers in Saldanha Bay often found it pursuing fish only a few hundred yards from the beach between Robben or Dassen Island and the continent. In Durban it was also seen close to the coast (occasionally as far out as 15 miles from shore), but never in company with the small “minkehval” (probably *B. acutorostrata*, or a subspecies closely akin) nor with other whales. As mentioned above it has occasionally been found 60–70 miles from the coast feeding upon Euphausiidæ.

It is most like the fin-whale in its manner of swimming, and can easily be distinguished from the small “minkehval.” When coming to the surface to breathe, it may be seen under the water for some time before it appears on the surface. During each such visit it blows four or five times (like the fin- and blue whales, whereas Rudolphi’s whale blows only once or twice) before diving down into deep water again. Between these four or five blows it does not go too deep down to be seen from the ship and followed. It blows far more strongly than does *B. acutorostrata*, and its breath smells worse than that of the other whales. In Durban it was observed to remain for an unusually long time under water between each visit to the surface. It is not seen to take crustaceans in the same peculiar way as Rudolphi’s whale (*B. borealis*). When shot it often swims

round in circles very quickly and gets the line wound round it, and is on the whole difficult to manage. Large females are less difficult to shoot than the others, as they are not so quick in their movements.

Gravid females do not seem to be followed by their males as is the case with the humpback whale. For instance, two females captured in Saldanha Bay, March 12, 1913, and with fetuses measuring 0.935 and 3.78 metres, were swimming about quite alone. Some males captured at this time were also solitary.

They are gravid at very different times, and females were found with fetuses of different sizes both in Saldanha Bay and Durban, at the same time as others were followed by young with a length of about 6-7 metres.

It may be mentioned as a curious fact that almost all the "sei"-whales captured in Saldanha Bay from March 5-13, 1913, went southwards when the whaling steamers began to hunt them.

The flesh of *B. brydei* contains less oil than does that of other species of its genus, with the exception perhaps of *B. borealis*. When fresh and served like beef-steak it tastes quite good, as I had an opportunity of proving when at Saldanha Bay.

The Fetus.

About an equal number of each sex of *B. brydei* seem to be caught. Many of the females were gravid, and, as mentioned above, with fetuses of very different sizes:—*e. g.*, in two gravid females examined by me in Saldanha Bay, March 12, 1913, the fetuses had a length of 0.935 and 3.78 metres (Pl. CXIII. figs. 12, 13). The mammae in both these specimens were very well developed, and, when they were dragged out of the water, about a half-gallon of mucus ran out of their genital openings, as has sometimes been observed shortly after the birth of the young in other whales. The largest fetus was full-grown, and fell out when the men began to remove the stratum of fat from the whale.

The following table shows some measurements of the two fetuses.

In the larger fetus the penis was placed in a furrow which ran backwards from the umbilicus for about 12 cm. The baleen had just appeared and was thick and soft, with a length of about 3 cm. The bristles had an average length of 6-8 mm. and were generally only to be seen at the base of the baleen. The anterior and posterior baleen only appeared as small ridges. The dorsal fin was bent down to the back on the left side, both the apex and the tip being curved to an unusual extent, and the hinder margin deeply concave. The tail-flukes were strongly bent together towards the median line of the body. The colour above was a uniform bluish black, and whitish grey

	<i>Male.</i>		<i>Female.</i>	
		per cent.		per cent.
Total length	3.78	100	0.935	100
Tip of snout to anterior end of eye	0.63	16.6	0.175	18.7
" " angle of mouth	0.70	18.5	0.166	17.7
" " anterior end of dorsal fin	2.47	65.3	0.655	70.0
" " blowholes	0.45	11.9	0.13	13.9
" " flippers (anterior margin)	1.2	31.7	0.30	32.0
From notch of flukes to vent	1.04	27.5	0.255	27.2
" " vulva or penis	1.35	35.7	0.273	29.1
Length of flipper	0.43	11.3	0.062	6.6
Greatest breadth of flipper	0.13	3.4	0.03	3.2
Breadth of flipper at its base	0.11	2.7	0.042	4.4
Vertical height of dorsal fin	0.13	3.4	0.026	2.7
Length of dorsal fin at its base .....	...	...	0.038	4.0
Diameter of eye	0.05	...	0.023	...
Length of eye-opening .....	...	...	0.015	...
Length of blowholes	0.10	...	0.02	...
Distance between the anterior end of blowholes	0.023	...	0.007	...
" " posterior end of blowholes	0.073	...	0.025	...
Length of anus	0.02	...	0.007	...
Length of penis or vulva	0.10	...	0.015	...
Diameter of penis at its base	0.03	...	...	...
Number of furrows between the flippers	48	...	42	...
Distance from penis to the umbilicus	0.33	...	...	...
From tip of lower jaw to anterior margin of umbilicus .....	...	...	0.51	54.5
Diameter of the umbilicus	0.09	...	0.03	...
Breadth of tail-flukes at their base	0.32	...	...	...
Distance between the tips of flukes	0.42	...	0.20	21.3
Distance from notch of flukes to tip of flukes	0.38	...	...	...
Breadth of the body at the flippers .....	...	...	0.12	12.8
Height of the body at base of flippers .....	...	14.4	0.17	18.1
" " at tip of flippers .....	...	13.8	...	...
" " at the eyes .....	...	13.2	...	...
" " at the dorsal fin .....	...	9.6	...	...
" " at the tail, just in front of flukes .....	...	3.6	...	...

everywhere on the under side. The change from the dark to the light colour along the sides was gradual, and no definite outline could be seen. There was a more greyish area just behind the eyes on each side.

No baleen was to be seen on the smaller foetus, and the whole body was of a homogeneous, reddish brown colour.

Abnormal Specimens.

A large female specimen with a total length of 14.95 metres, captured in Durban, November 15th, 1912, was very like the fin-whale in colour, for the flippers were white below and the colour asymmetrical as it is in the fin-whale. The lower jaw and the distal part of the upper jaw were white on the right side, while those parts on the left side were bluish black. On the right side there was also a greater number of white baleen-plates than

on the left. The furrows were bluish black in a belt across the under side of the head and backwards to the flippers, but only a comparatively small part of the throat on the left side was uniformly dark-coloured. No hairs were to be seen on the tip of the lower jaw. This specimen was unusually slender and thin and probably was very old and diseased. The stratum of fat was only about 3.5 mm. thick; and there were numerous wounds distributed over the whole body (Pl. CXIII. fig. 14). These wounds were more or less inflamed and partly filled up with mortifying fat, and in some of them a *Pennella* was found. This specimen was lying quite motionless on the surface when it was observed from the whaling steamer, and was thus very easily taken.

The whalers from Durban told me that on one occasion they had caught a whale of this species, which on the whole under side of the body was of a colour much resembling that of the blue whale (*B. musculus*); but when it was taken it proved to be a "herring" whale (*B. brydei*).

Parasites.

Parasites are comparatively rare in this species; an old female (Durban, November 15th, 1912) had, as mentioned above, distributed over the whole body a large number of oval-shaped wounds, with a length of as much as 10 cm., and a depth of 2-4 cm. (Pl. CXIII. fig. 14). Almost all of these wounds were partly filled with mortifying fat and had been caused by a large *Pennella*, specimens of which were found in some of them. A smaller number of these wounds was found on this species at Saldanha Bay, but they were very numerous in the few old and apparently diseased specimens taken at Porto Alexandre.

A species of Myxinoid sometimes makes similar wounds in Bryde's whale, but I did not obtain specimens of them because they always leave the whale when it is dragged out of the water. I do not know whether they are to be found on the whale when alive, or only after its death.

EXPLANATION OF THE PLATES.

PLATE CIX.

Balænoptera brydei.

- Fig. 1. Side view of male.
2. Lower surface of male.

PLATE CX.

Balænoptera brydei.

- Fig. 3. Male specimen, showing the dorsal side and anterior end of the body. Saldanha Bay, 12.9.12.
4. Same specimen as fig. 3, from the ventral side.
5. Female specimen, from the dorsal side. Saldanha Bay, 12.3.13.

PLATE CXI.

Balænoptera brydei.

- Fig. 6. Head of a large, but very thin and apparently sick, female specimen, with numerous wounds from parasites (*Pennella*). Durban, 15.11.12.
 7. Caudal portion, with the dorsal fin, of a male specimen.
 8. Female specimen, from the ventral side. Saldanha Bay, 12.3.13.

PLATE CXII.

- Fig. 9. Bristles of baleen from *Balænoptera borealis*, captured outside Saldanha Bay, -11.12.
 10. Bristles of baleen from *B. brydei*, captured outside Saldanha Bay, -11.12.
 11. Baleen from adult specimens of (A) *B. borealis*, and (B) *B. brydei*.

PLATE CXIII.

Balænoptera brydei.

- Fig. 12. Fœtus, 0.935 m. in length. Saldanha Bay, 12.3.13.
 13. Fœtus, 3.78 m. in length. Saldanha Bay, 12.3.13.
 14. Portion of body of same specimen as fig. 6, showing wounds from parasites (*Pennella*). Durban, 15.11.12.

EXHIBITIONS AND NOTICES.

October 28, 1913.

Prof. E. A. MINCHIN, M.A., F.R.S., F.Z.S. Vice-President,
 in the Chair.

THE SECRETARY read the following report on the additions that had been made to the Society's Menagerie during the months of May, June, July, August, and September, 1913:—

MAY.

The registered additions to the Society's Menagerie during the month of May were 268 in number. Of these, 133 were acquired by presentation, 52 by purchase, 31 were received on deposit, 13 in exchange, and 39 were born in the Gardens.

The number of departures during the same period, by death and removals, was 185.

Amongst the additions special attention may be directed to:—

2 White-bearded Gnus (*Connochates albojubatus*), from British East Africa, new to the Collection, received in exchange on May 19th.

2 Chimpanzees (*Anthropopithecus troglodytes*), 1 Anubis Baboon (*Papio anubis*), from West Africa, and several small Monkeys, presented by W. O. Danckwerts, Esq., K.C., F.Z.S., on May 2nd, 28th, and 31st.

1 Crowned Duiker (*Sylvicapra coronata*), presented by Capt. C. H. Armitage, C.M.G., D.S.O., F.Z.S., on May 4th.